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C. In 20 insane, I, 40; II, 35; III, 20; IV, 5.
D. In four murderers, I, 0; II, 75; III, 25.
E. In three negroes, I, 33; II, 67.

So far as these 58 individuals are concerned, the most common combination, viz., left continuity and right separation, is decidedly the rule with the moral and educated, less frequent with the ignorant and unknown, the insane and negroes, and does not occur at all in the murderers. The only instance of the reverse combination (left separation and right continuity) is an insane Swiss woman. The only two known to be left-handed presented the more frequent combination I. (Journ. Comp. Neurol. Cincinnati, Vol. VI, 1896.)

PSYCHOLOGY.[1]

The Nature of Feeling.—A cardinal point of dispute in current psychology is the nature of feeling. The division of simple feeling into pleasure and pain is generally accepted; the question that remains unsettled is the relation of these latter to sensation. Wundt, Lehmann, Marshall and other recent writers, whose views differ in important respects, agree in regarding pleasure-and-pain as a characteristic of sensation (its *Gefühlston*) like quality or intensity. On the other hand there are those who claim that pain (at least) is a separate species of sensation, with a distinct set of nerves and end-organs. Goldscheider at one time believed that he had discovered these pain nerves, but he has recently retracted this claim. Others, again, regard pain as an extreme form or quality of sensation common to the touch, heat and cold senses.

The problem is somewhat complicated by the ambiguity of the word *pain*. In the sense of "physical pain" (*Schmerz*) it may be a species of sensation; while at the same time in the sense of "displeasure" (*Unlust*) it may be regarded as either an "attribute" of sensation or a second element of consciousness. This distinction is maintained by Münsterberg and Baldwin, among others.[2] The ordinary associations of the word *pain* have undoubtedly biased many writers and helped to keep alive the confusion between its two meanings.

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[1] Edited by H. C. Warren, Princeton University, Princeton, N. J.

[2] Dr. Nichols in his criticism of Baldwin in the September number of this magazine certainly misapprehends the latter's view on this point. Cf. Mental Development, pp. 483, f.

Prof. Titchener in treating of the subject in his Psychology[3] endeavors to avoid this ambiguity by discarding the terms pleasure and pain, and using *pleasantness* and *unpleasantness* instead. Apart from his terminology, Prof. Titchener's discussion is of special interest from the fact that, although an earnest follower of Wundt in most respects, he recognizes feeling or affection, as a distinct element of consciousness. Wundt reduces all consciousness (aside from the active) to a single element, sensation; Prof. Titchener restricts sensation to the cognitive side of consciousness, and makes affection a distinct and co-ordinate term.

The mind, or consciousness, he says, "not only senses: it *feels.* It not only receives impressions and has sensations: it receives impressions in a certain *way*. . . . Life means the balance of power (more or less effective) in the perpetual conflict of two opposing forces—growth and decay. No impression can be made upon the living body that does not tend in some way to change this balance. . . . It must help either to build up nervous substance or to break it down. The organism is a whole: and what effects it in either of these ways at one part, must affect it as a whole, in all. The conscious processes corresponding to the general bodily processes thus set up by stimuli—processes not confined to definite bodily organs—are termed *affections*. . . . There are only two bodily processes to give rise to affective processes: the building-up process (anabolism) and the breaking-down process (catabolism). We should expect, then, to find no more than two qualities of affection; and introspection tells us that expectation is correct. The anabolic bodily processes correspond to the conscious quality of *pleasantness*, catabolic processes to that of *unpleasantness*."

Prof. Titchener then examines the relation of affection to sensation. "The processes of pleasantness and unpleasantness seem, at least in many cases, to bear a strong resemblance to certain concrete experiences which we have analyzed, provisionally, as complexes of sensations. Thus pleasantness may suggest health, drowsiness, bodily comfort; and unpleasantness pain, discomfort, overtiredness, etc. . . . Now there can be no doubt of the resemblance in the instances cited. But the reason of it is simply this, that health, drowsiness and bodily comfort *are* pleasant, *i. e.*, that pleasantness is one of the constituent processes, running alongside of various sensation processes, in the total conscious experience which we call 'health,' etc.; and that pain, bodily discomfort and overtiredness *are* unpleasant, *i. e.*, that unpleasantness is one of the processes contained in each of these complex experiences.

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[3] An Outline of Psychology, by E. B. Titchener, Chap. V.

Beyond this there is no resemblance: a sensation process is radically different from a pleasantness or an unpleasantness." This difference appears in several ways:

(1). The sensation is looked upon as belonging to the object which gives rise to it, while the affection is regarded as belonging to the subject or conscious self. "Blue seems to belong to the sky; but the pleasantness of the blue is in me. Warmth seems to belong to the burning coals; but the pleasantness of warmth is in me. . . . The distinction is unhesitatingly drawn in popular thought, and clearly shown in language. It points to a real difference between sensation and affection as factors in mental experience—a difference which the psychologist must make explicit in his definition of the two processes. The same difference is observed even when we compare the affective processes with those sensations which are occasioned from within, by a change in the state of the bodily organ. The unpleasantness of toothache is far more personal to me than the pain of it. The pain is 'in the tooth;' the unpleasantness is as wide as consciousness."

(2). If a stimulus be long continued, the affection, if it is not of such a character as to pass over into pain, in the end becomes indifferent, while the sensation remains as strong and clear as ever, when the attention is directed to it. "Nervous substance, at the same time that it is very impressionable, is eminently adaptable. The organism adjusts itself to its circumstances—resigns itself, so to say, to their inevitableness. When once adaptation or adjustment to surroundings is complete, the surroundings cease to be taken either pleasantly or unpleasantly; their impressions are simply received, passively and unfeelingly."

(3). "The more closely we attend to a sensation, the clearer does it become, and the longer and more accurately do we remember it. We cannot attend to an affection at all. If we attempt to do so, the pleasantness or unpleasantness at once eludes us and disappears, and we find ourselves attending to some obtrusive sensation or idea which we had no desire to observe."

(4). "As a general rule, 'central' sensations are much fainter and weaker than 'peripheral.' A remembered noise has hardly anything of the intensity of the noise as heard. Affection can originate in the same two ways. But 'central' pleasantness and unpleasantness are not only as strong as—they are in very many cases stronger than —'peripheral.'"

"We see, then," concludes Prof. Titchener, "that there are strong reasons for regarding affection as different from sensation. It must be carefully noted that the statements just given of these reasons do not tell us *how* 'red,' a sensation, differs from 'pleasantness,' an affection, in mental experience. They are sufficient indication that a real difference exists; but the difference itself cannot be described—it must be experienced."

It remains to be seen how this theory, or rather Prof. Titchener's restatement of it, will be met by the adherents of the Wundtian view. As to the verbal innovation, the terms *pleasantness* and *unpleasantness* would be more welcome if the proposed meanings accorded better with ordinary usage. Both words, especially the second, are suggestive of a very mild form of feeling; and until we became accustomed to the change it would excite our sense of the ludicrous to call the feeling connected with a violent toothache or an intense abdominal pain *unpleasant.*—H. C. WARREN.

Further Comments on Prof. Baldwin's " New Factor in Evolution."—In a " Note" in THE AMERICAN NATURALIST, October, 1896, Prof. Baldwin declares that I have grossly misunderstood his views, and that, to quote his words, "Dr. Nichols' home thrusts are all directed at my view of pleasure and pain, which he considers, quite mistakenly, the point of my paper. On the contrary, the 'factor' is entirely the influence of the individuals adaptation on the course of evolution; not at all the particular way in which the individual makes its adaptation."

This quotation is typical of the author's style of thinking and writing; of which his critics unanimously complain. The word " influence " is frequently misused by careless writers, as in the above, to denote the *results* of a factor, rather than the factor itself. A " factor " is a set of influences or circumstances contributing *to produce* a result. It is true that an author, if of expansive mind, may run ahead of his subject. It is true, as Prof. Baldwin above declares, that his mind was chiefly on the results supposed by him to be worked by his factor. But he should not forget that he declared himself, in his title, to be writing about his " new factor "; and it was quite correct that he should write about it, since one ought, in Science, to establish the existence of a thing before discussing its effects. It was this last I had in view when, in my paper, I directed my discussion toward demonstrating that his new factor, as specificly described by Prof. Baldwin, was a myth.

I directed my discussion against Prof. Baldwin's views of pleasure and pain because he completely identified his " factor " with his particular and all-expansive views of pleasure and pain. On p. 451 of his pamphlet, he sums up his June paper in these words: "It seems proper, therefore, to call the influence of Organic Selection "a new factor; . . . . *The ontogenetic adaptations are really new, not performed; and they are really reproduced in succeeding generations, although not physically inherited.*" Here the author correctly, though in flat contradiction to his Note, declares in so many words his factor *to be* Organic Selection, and "ontogenetic adaptations" is for it but another name. Of this fact the words which he italicized leave no doubt. Naturally, to find out most accurately what Prof. Baldwin means by Organic Selection, we go to that part of his writing which most professedly expounds it. This is done in Part IV, p. 541, under the caption: "The Process of Organic Selection." After preliminary remarks, which I shall speak of later, Prof. Baldwin's exposition is in the following words:

> "There is a fact of physiology which, taken together with the facts of psychology, serves to indicate the method of adaptations or accommodations of the individual organism. The general fact is that the organism concentrates its energies upon the locality stimulated, for the continuation of the conditions, movements, stimulations, which are vitally beneficial, and for the cessation of the conditions, movements, stimulations, which are vitally depressing and harmful. In the case of beneficial conditions we find a general *increase of movements, an excess discharge of the energies of movement in the channels already open and habitual; and with this as the psychological side, pleasurable consciousness and attention.* . . . This form of concentration of energy . . . is called the "circular reaction." It is the selective property which Romanes pointed out as characterizing and differentiating life. It characterizes the responses of the organism, however low in the scale, to all stimulations—even those of a mechanical and chemical nature— . . . Now, as soon as we ask how the stimulations of the environment can produce new adaptive movements, we have the answer of Spencer and Bain—an answer directly confirmed, I think, without question, by the study both of the child and of the adult, *i. e.*, by the selection of fit movements from excessively produced movements, that is, from *movement variations.* So, granting this, we now have the further question: How do these movement variations come to be produced when and where they are needed?"

Having reduced his problem of "the selection of fit movements," *i. e.*, of Organic Selection, to this pointed inquiry, Prof. Baldwin then proceeds to state his still more explicit exposition of his selective "factor" in full, as follows:

> "But, as soon as we inquire more closely into the actual working of pleasure and pain reactions, we find an answer suggested [an answer to the last above quoted question]. The pleasure or pain produced by a stimulus—and by a movement also, for the utility of a movement is always that it secures stimulation of this sort or that—does not lead to diffused, neutral, and characterless movements, as Spencer and Bain suppose; this

is disputed no less by the infants movements than by the actions of unicellular creatures. There are characteristic differences in vital movements wherever we find them. There is a characteristic antithesis in vital movements always. Healthy, overflowing, overstretching, expansive, vital effects are associated with pleasure ; and the contrary, the withdrawing, depressive, contractive, decreasing, vital effects are associated with pain. This is exactly the state of things which the theory of the selection of movements from over-produced movements requires, *i. e.*, that increased vitality, represented by pleasure, should give the excess movements, from which new adaptations are selected ; and that decreased vitality, represented by pain, should do the reverse, *i. e.*, draw off energy and suppress movement.

''If, therefore, we say that here is a type of reaction which all vitality shows we may give it a general descriptive name, *i. e.*, the ''Circular Reaction,'' in that its significance for evolution is that it is not a random response in movement to all stimulations alike, but that (it distinguishes etc.) it distinguishes in its very form and amount between stimulations which are vitally good and those which are vitally bad, tending to retain the good stimulations and to draw away from and so suppress the bad. . . . *This kind of selection, since it requires the direct co-operation of the organism itself, I have called Organic Selection.*''

"This" (note the last sentence), then, is the "Organic Selection" which Prof. Baldwin himself specifically declares (p. 451) he names a " new factor." As the reader must see for himself, the author's description of it is a description of pleasure-pain functions pure and simple and nothing more. It is not *merely* the old pleasure-pain tradition, for nothing remains inexpansive in this vigorous author's hands. But it is the orthodox tradition unfolded to " a type of reaction which all vitality shows ;" which " distinguishes in form and amount between stimulations which are vitally good and those which are vitally bad ;" "which is a characteristic antithesis in vital movements always;" which "is the selective property which Romanes pointed out as characterizing and differentiating life;" and which performs its task of the "*selection of fit movements*" generally, by its universal exercise in all creatures from first to last and at all times.

It is dangerous to grapple with an author who is so macrocosmic in his thought, and so amorphous in his diction. But I discussed Mr. Baldwin's " New Factor" from the point of view of his "expanded" pleasure-pain functions because he so completely *identified* it with them. I cannot conceive this to have been done more explicitly and completely than in the author's specific exposition of Organic Selection in his Part IV. Under this situation it was surely " to the point" to prove Mr. Baldwin's New Factor a myth. The tone of Mr. Baldwin's " Note" seems to indicate that this was done with peculiarly exhaustive effect.

A word remains to be said about Mr. Baldwin's complaint that his pamphlet distinctly insisted on *the fact* of Organic Selection, without regard to any " particular way " it may be accomplished. Prof. Baldwin did file such a caveat upon all possible ways which man may ever invent for proving that Organic Selection *may be* a fact. But this is not the method of Science. She does not feel called upon *to invent* all possible ways before she rejects the sole one offered. When Prof. Baldwin does give us some other " particular way " than the one he did give for the operation of his factor, I will, perhaps, then be able to show him it cannot be called "new" with any sort of justice to Darwin and to biologists commonly.

Of the personal tone of Mr. Baldwin's " Note " I have nothing to remark, save by way of gratification, that it is unmatched in American Science. HERBERT NICHOLS.

Boston, Oct. 14, 1896.

ANTHROPOLOGY.[1]

Pictured Caves in Australia.—In West Australia, New South Wales, Queensland, and doubtless in other parts of Australia, where the geology is favorable, rock shelters and caves have been recently noticed, whose walls are decorated with native allegorical designs and figures of men, birds and animals outlined in colour. Mr. T. Wornsop addressing the Australasian Association for the Advancement of Science at Brisbane in January, 1895 refers to a great number of rock paintings of Kangaroos, Lizards, Emus, Flying birds, Snakes and other forms. Refering to discoveries of these strange and impressively decorated shelters by Sir George R. Grey, Mr. Stockdale, Mr. O. Donnell and others, he states that a general similarity characterizes the designs wherever found, and describes further the curious method of painting generally noted, which appears to consist in smearing the rock surfaces with animal fat, pressing the object to be represented against the greased rock, and then blowing dry color against it so as to thus stencil the outlined form by a surrounding area of contrasting tint. When wet color was splashed on, no grease would have been needed. Mr. W. J. Enright, the discoverer of numerous painted caves and Mr. R. H. Matthews describe in particular the abundant figures of human hands with

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[1] This department is edited by H. C. Mercer, University of Pennsylvania.